Channel devices address information only for external Fibre Channel devices in the same zone as the external Fibre Channel device providing the address information query.

Remarks

In an Office Action dated October 10, 2001, the drawings were objected to; claims 1, 27 and 33 were objected to and claims 1-4, 7-9, 11-20, 22, 23, 26-30, 32-34, 37-43 and 46 were rejected under 35 U.S.C. § 103. In this response the drawings are revised and the objections and rejections of the claims are respectfully traversed.

Review of Preferred Embodiments

Prior to addressing the objections and rejections, it is considered helpful to provide a brief overview of the preferred embodiments and background in Fibre Channel networks. Fibre Channel is a networking system defined by a series of ANSI standards. Two basic types of connections are defined, loop and point-to-point. Loop devices arbitrate for control of the loop, while point-to-point connections are direct between two devices. Point-to-point connections between end devices and switches are used to develop a Fibre Channel fabric, with loop devices potentially also being part of the fabric by having the loop connected to a switch. Devices log into the fabric when they connect to the fabric. Part of the log in process involves querying the Simple Name Server (SNS) in the fabric to obtain a list of other devices in the fabric. In response to this query, the SNS returns an address list of the other devices.

In the prior art designs the SNS returned the addresses of all of the devices in the fabric. In one embodiment according to the present invention, the SNS does not return the addresses of all of the devices in the fabric, only those configured within the same zone as the device logging into the fabric. By only providing the addresses of the devices in the same zone, the SNS has restricted the communications between the device logging into the fabric and the existing devices on the fabric.

In a second embodiment, communications are restricted in a different manner. In the first embodiment, a device might still be able to communicate with a device outside of its zone if it can otherwise determine the address of the "outside" device. The second embodiment restricts this type of communication by restricting communications between specific ports of a device, such as a switch, by examining the ports in hardware and then blocking the communication.

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Further details on the embodiments are provided in the Detail Description portion of the present patent application.

With this brief review of the general nature of Fibre Channel networks and brief overview of two embodiments according to the present invention, it is appropriate to address the Office Action.

Drawing Objections

The drawings have been revised in response to the objection and new drawings are provided. It is respectfully submitted that the new drawings overcome the objections.

Claim Objections

Claims 1, 27 and 33 were objected to because of an alleged misspelled word. This objection is respectfully traversed. As noted above, as described at page 2, line 7 of the present specification and as clear from references L-P provided in the Information Disclosure Statement filed in this case, Fibre Channel is the proper name of the standard being referenced. The terms have been properly capitalized in the claims in this amendment. As such, it is respectfully submitted that the objection is improper and should be withdrawn.

Claim Rejections

Claims 1-4, 7-9, 11-20, 22, 23,26-30, 32-34, 37-43 and 46 were rejected under 335 U.S.C. § 103 over Chang. The rejection is respectfully traversed.

As understood, Chang describes a technique for developing networks and subnetworks in an ATM system. The routers in the subnetworks route packets according to Figs. 4 and 5 of Chang, basically forwarding packets from inside to outside the subnetwork and discarding received packets not intended for the subnetwork, i.e., not addressed to a device on the subnetwork.

Claim 1 requires "responsive to the definition of the first configuration, restricting communications between the devices coupled to the first fabric." The Office Action cites Fig. 4, steps 525 and 507 and Fig. 5, steps 557 and 561 of Chang as teaching this requirement. This correspondence is respectfully traversed. Referring to Chang, col. 8, lines 11-43, these steps handle cases where an address is outside the subnetwork. Step 525 is reached either via step 523, the path where the receiving device is not addressed, or step 527, if the request is self-generated. It is respectfully submitted that neither of

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these cases describe a case where a communication between devices has been restricted. In the first case through step 523, there is no communication possibility because the requested address is not on the subnetwork. Thus there cannot be any communication. In the second case, there is no communication between devices because the receiving device is also the sending device. Thus, it is respectfully submitted that Fig. 4 of Chang, and the accompanying description, do not teach or suggest the language of claim 1.

Similar arguments exist for the citation to Fig. 5 of Chang. The referenced steps are described at col. 9, lines 20-44. The first path from step 551 to step 553 to step 557 is again the case of discarding a packet not addressed to the subnetwork, as in the first case of Fig. 4 described above. Similarly, the second case from step 551 to step 559 to step 561 is the case of discarding the packet because it is self-generated, as in the second case of Fig. 4 described above. Thus the Fig. 5 references also do not teach restricting communications between devices because in the first case there is no communication in the first place and in the second case it is not between devices.

Therefore it is respectfully submitted that the teachings of Chang do not teach or suggest all of the elements of claim 1, so the rejection should be withdrawn.

Claims 27 and 33 also both include elements requiring restricting communications between devices, similar to the requirement of claim 1. As such, the arguments with respect to Chang and claim 1 apply equally, so it is respectfully submitted that the rejections are improper and should be withdrawn.

Claims 4, 29, and 34 were also rejected under § 103 over Chang. While these claims are allowable as being based on an allowable claim, these rejections are respectfully traversed with respect to these claims. Claims 4, 29 and 34 relate to the first device querying for the address of a second device and the address of the second device being returned only if the first and second devices are in the same zone.

The Office Action cites Fig. 4, steps 503 and 509 and Fig. 7, steps 601-603, 605, 607, 613 and 615. It is respectfully submitted that the cited sections do not teach or suggest the claim requirements and do not support the rejections. The packets described in those steps already all include a destination address. They are not queries for the address of a second device.

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Step 503 relates to determining the layer protocol of the packet. This has nothing to do with a first device querying for the address of a second device. Step 509 clearly indicates that the destination address is already known (or is not relevant in the case of a broadcast packet) because the step tests to determine if the end station is within the same network or a broadcast. To do this determination, the address must be known or not be relevant. The same is true in the decision in step 505.

Addressing then Fig. 7 and steps 601-603, 605, 607, 613 and 615, it is clear that the first device included some destination address because a packet has clearly been transmitted, as seen in step 602. The remaining steps provide a destination address to the first device, but only to store it, presumably for future use. But it is clear that there is no indication whatsoever that the packet was a query request for an address of a second device. The packet already included some destination address, as the packet was routed through the network without the need to use the provided destination address.

Therefore, it is respectfully submitted that the teachings of Chang do not teach or suggest the elements of claims 4, 29 and 34 and the rejections should be withdrawn for these further reasons.

The remaining claims are submitted as being allowable because they are dependent from allowable claims.
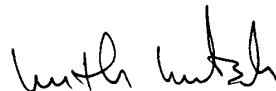
Cancelled Claims

Claims 7-10, 14 and 30-31 have been cancelled. Those claims, and the general subject matter of those claims, is now being pursued in a divisional application entitled "Method and System for Creating and Implementing Zones in Hardware Within a Fibre Channel System," filed January 29, 2002, by the same inventors as this case. It is respectfully submitted that this is a proper divisional case, but the Examiner is hereby put on notice of the separation of the cases and is requested to confirm the separate nature.

New Claims

New claims 47-50 are provided in this amendment. It is respectfully submitted that the claims are allowable.
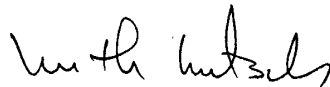
Respectfully submitted,

(signature)

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(signature)

Keith Lutsch

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: §
§
David Banks §
Kumar Malavalli §
Paul Ramsay §
Kha Sin Teow §
Jieming Zhu §
§ Docket No. 112-0026US
Serial No. 09/426,567 §
§ Art Unit 3676
Filed: October 22, 1999 §
§ Examiner: K. Harper
For: METHOD AND SYSTEM FOR §
CREATING AND IMPLEMENTING §
ZONES WITHIN A FIBRE §
CHANNEL SYSTEM §

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In The Claims

Please cancel claims 7-10, 14, 30 and 31.

Please revise claims 1, 27 and 33 to read as follows:

1.   (AMENDED) In a system comprising a first fabric and a plurality of devices coupled to the first fabric by [fibre channel] Fibre Channel connections, a method for logically organizing the devices comprising:

accessing a definition of a first configuration including at least one zone, each zone including at least one device as a member of the zone; and

responsive to the definition of the first configuration, restricting communications between the devices coupled to the first fabric.

27.   A fabric element for use in a system comprising a first fabric and a plurality of devices coupled to the first fabric by [fibre channel] Fibre Channel connections, the fabric element comprising:

a plurality of ports, each port adapted to be coupled to a device by a [fibre channel] Fibre Channel connection;

a storage medium for storing a definition of a first configuration including at least one zone, each zone including at least one device as a member of the zone; and

a logic device coupled to the plurality of ports and to the storage medium, for, responsive to the definition of the first configuration, restricting communications for devices coupled to the plurality of ports.

33. A computer readable medium containing software for logically organizing a plurality of devices coupled to a first fabric by [fibre channel] Fibre Channel connections, the software for instructing a processor to perform the steps of:

accessing a definition of a first configuration including at least one zone, each zone including at least one device as a member of the zone; and

responsive to the definition of the first configuration, restricting communications between the devices coupled to the first fabric.

Please add new claims 47-50 as follows:

47. A Fibre Channel device for use in a Fibre Channel Fabric, the fabric coupling a plurality of external devices, the fabric configured into at least two zones, where the external devices are allowed to exchange data packets only with external devices in the same zone, an external device querying for address information when coupled to the fabric, the Fibre Channel device comprising:

a Fibre Channel port for receiving an address information query from an external device;

a storage medium for storing a first configuration including at least two zones;

a simple name server coupled to said Fibre Channel port and said storage medium for responding to the address information query with external devices address information only for external devices in the same zone as the external device providing the address information query.

48. A Fibre Channel switch for use in a Fibre Channel Fabric, the fabric coupling a plurality of external devices, the fabric configured into at least two zones, where the external devices are allowed to exchange data packets only with external devices in the same zone, an external device querying for address information when coupled to the fabric, the Fibre Channel switch comprising:

a Fibre Channel port for receiving an address information query from an external device;

a storage medium for storing a first configuration including at least two zones;

a simple name server coupled to said Fibre Channel port and said storage medium for responding to the address information query with external devices address information only for external devices in the same zone as the external device providing the address information query.

49. The Fibre Channel switch of claim 48, wherein said simple name server includes:

a CPU module; and

software executing on said CPU module to provide said simple name server functionality.

50. A Fibre Channel network comprising:

a plurality of external Fibre Channel devices; and

a Fibre Channel fabric coupling said plurality of external Fibre Channel devices, wherein the fabric is configured into at least two zones, where the external Fibre Channel devices are allowed to exchange data packets only with external Fibre Channel devices in the same zone and the external Fibre Channel devices query for address information when coupled to the fabric wherein said Fibre Channel fabric includes:

a Fibre Channel port for receiving an address information query from an external Fibre Channel device;

a storage medium for storing a first configuration including at least two zones; and

a simple name server (SNS) coupled to said Fibre Channel port and said storage medium for responding to the address information query with external Fibre Channel devices address information only for external Fibre Channel devices in the same zone as the external Fibre Channel device providing the address information query.